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II. *The Variation of the Compass; containing (a) 1719 Observations to, in, and from, the East Indies, Guinea, West Indies, and Mediterranean, with the Latitudes and Longitudes at the Time of Observation. The Longitude for the most Part reckoned from the Meridian of London; if otherwise, it is taken Notice of in the Margin. By Mr. Robert Douglaſs. Recommended to the Public by the late Dr. Halley. Communicated by the Rev. Nevil Maskelyne, Astronomer Royal, F. R. S. with a Letter prefixed from William Mountaine, Esq. F. R. S. to Mr. Maskelyne.*

TO THE REV. NEVIL MASKELYNE, A. R. F. R. S.

DEAR SIR,

St. John's, Southwark,  
Nov. 24, 1774.

R. June 1, 1775. **M** R. ROBERT DOUGLASS's observations of the variation, taken by himself, and signed by DR. HALLEY, I now beg leave to return, with answers to the questions you propos'd thereupon; viz. Whether I had ever seen them; or had made any use of them in my former publications? And if so, whether any further notice of them was necessary? In answer to the first; among my papers on the variation I have an exact copy of them, recommended under the same signature, of the same date, and in the same words, and the

(a) DOUGLASS calls these 1719 observations; but these tables, I rather think, should be called the Result of 1719 Observations. W. MOUNTAINE.

whole seems written by the same hand; so that both of them (containing 1719 observations each) may be stiled originals: I have sent mine herewith for your inspection. To your second question, I answer, that I could not make any use of them in the construction of either of my charts, as the first was formed from actual observations made about the year 1744, and DOUGLASS's conclude in the year 1735; but as many of them as suited the periodic times were taken in, and compared with many thousands of others, according to the order of their respective-dates, in forming the six periodic reviews, as published in the Philosophical Transactions, vol. L. part I. for 1757. To the third question; *viz.* whether they are worth a public record? I rather think they are; and have sometimes thought to present them to the Royal Society for their approbation: for, notwithstanding they have been thus made use of, yet they are mixed and moulded up with others, and those only to every five degrees of latitude and longitude; so that the variations respecting the several latitudes and longitudes do not singly appear. And as the true theory of this *arcane* in nature is yet so little known, every thing that serves to illustrate it, deserves attention. And as these tables, for a single set, are extensive, and may be esteemed authentic, they may very well serve for comparatives in future times; for if the change of the variation be regulated by any constant law, which I still continue to doubt, the discovery of that law must greatly depend upon such comparisons made from multitudes of good observations

taken at different periods, and those over the whole face of the terraqueous globe; but until that law is certainly known, charts can be constructed only from time to time from the latest observations. I am, &c.

W. MOUNTAINE.

P. S. From the differences, times considered, between these identical observations of DOUGLASS, and Dr. HALLEY's chart in 1700, Mr. CHARLES LEADBETTER attempted, with great labour, to delineate a set of curves for the year 1740, but without success. He seems, by his unfinished work, to have plunged himself into an inextricable labyrinth. I have the manuscript chart and his table of differences now in my custody. His attempt was frustrated by the opinion he possessed of an uniform and regular mutation; and this failure further convinced me of the necessity of proceeding upon other principles.

On the outside leaf of each copy is the following testimonial:

*Mr. ROBERT DOUGLASS having shewn me this curious collection of Observations of the Magneticall Variation, made by himself in most parts of the world, I thought them worth preserving, and as such recommend them to the public, believing they may be of use both to the present and future navigation.*

Greenwich,  
Aug. 28, 1738.

EDM. HALLEY.

To

To the right honourable the Lords Commissioners for executing the office of Lord High Admiral of Great Britain and Ireland, &c.

MY LORDS,

I HAVE already given in to this honourable board those observations I had to the East Indies, Guinea, and West Indies, but not those I had in a second voyage to the West Indies, nor from England to the Mediterranean. Dr. HALLEY has perused them, and recommended them to the public. And as nothing of this nature has ever yet appeared, to my knowledge, I hope they may be of use for ships bound to Guinea, West Indies, Mediterranean, and East Indies: and as I think that all things of this nature belong to this honourable board, especially by me who have served as school-master many years in the royal navy; therefore I most humbly dedicate them to your lordships, and am, with all due respect,

YOUR LORDSHIPS

most humble and most obedient servant,

Jan. 30, 173<sup>8</sup>.

R<sup>t</sup>. DOUGLASS.

THE

THE variation of the compass in a voyage to, in, and from, the East Indies, in the years 1721, 22, 23, and part of 24, from the Island Madeira, on board the Lyon, THOMAS MATHEWS, Esq. Commodore. Likewise the variation to Guinea, from the Isle of Mayo to Cape de Verd, along the Coast to Widah, Island St. Thomas, Cape Lopez; back again to the Coast of Guinea; then to the Island St. Thomas; from thence to Barbados, St. Christophers, Jamaica, Porto Bello, along the Coast to Cartagena; then to Jamaica through the Gulph of Florrida, as far as  $35^{\circ} 15'$  North, and West longitude from London  $61^{\circ} 56'$ ; back again to Antegoa; from thence to England, in the years 1725, 26, and part of 27, on board the Kinsale, RICHARD GIRLINGTON, Esq. Commander. Some more to the West Indies, on board the Lark, JOHN GRAY, Esq. Commander, in the years 1727 and 172 $\frac{1}{2}$ . More from England to the Mediterranean, as far as Leghorn, on board the Dreadnought, ALEXANDER GEDDES, Esq. Commander, in the years 1730 and 31. More in the Mediterranean, as far as Tripoly in Barbary, on board the Hector, the hon. Sir ROGER BUTLER, Commander in the years 1733, 34, and 35,

Note, the first column is the year and day of the month; the second and sixth, the variation; the third and seventh, the number of observations; the fourth, fifth, eighth, and ninth, the latitude and longitude at the time of observation. The longitude for the most part reckoned

reckoned from the meridian of London; if otherwise, it is taken notice of in the margin. When there are more observations than one, that set down is the mean. When in sight of land, I have set down its bearings and distance in the margin. E. stands for East, and W. for West variation.

We observed with 3 compasses outward-bound to the East Indies. The master of the ship managed one; the pilot his own; and I had the other, which I kept the whole voyage. We had but 2 homeward-bound; they seldom differed  $\frac{1}{2}$  a degree, and not often that: they were taken with all the exactness possible. I have set down the latitude and longitude of most of the places I went from, and the latitude and longitude I made the place ly in (that I was bound to) by my reckoning.

The VARIATION of the COMPASS to, in, and from, the East Indies, on board the Lyon, THOMAS MATHEWS, esquire, Commodore.

1721 Mar.	Var <sup>n</sup> . P. M.	N. 90 <sup>o</sup>	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. 90 <sup>o</sup>	Lat.	Long <sup>de</sup> .	
21	6 28W	2	29 20N	18 53W from London					Lat. of the W <sup>t</sup> end of Madeira 32 25 N. Long <sup>de</sup> , Wt. from London 17 42.
24	4 30	3	24 36	19 8					Bound for the island St. Jago.
25	3 36	2	23 0	19 36					
26	3 19	2	21 0	20 30					
28	2 25	2	16 40	22 38					
Apr. 8	2 30	1	14 15	23 26					Lat. of Port de Praya bay on St. Jago 15 10 N. obs <sup>n</sup> . Long <sup>de</sup> . Wt. from London 23 42 as I have taken it. Bound for Cape Bon Espe- ranza.
9	2 29	2	11 40	22 13					
10	2 21	4	9 44	21 32					
11	2 4	1	8 17	21 33					
12					2 14W	1	6 28N	20 42W	
13	2 11	2	5 40	20 37					
14	1 30	1	4 16	20 26					
15	1 20	2	3 30	20 30					
17	0 33	2	2 10	21 8	0 0	1	1 22	21 15	
18					0 40E	2	0 7	21 29	
20	0 22E	1	1 20S	21 25					

1721 Apr.	Var. <sup>n</sup> . P.M.	N. S. O.P.	Lat.	Long <sup>de</sup> .	Var. <sup>n</sup> . A.M.	N. S. O.P.	Lat.	Long <sup>de</sup> .		
21	0 38W	1	1 46S	21 5W						
22	1 13	2	1 48	21 0						
May 2					2 11E	2	14 10S	25 14W		
3					3 0	1	16 0	26 42		
4	3 42E	1	16 50	27 16	3 26	3	18 0	28 2		
5	4 20	3	19 0	28 22	5 15	2	20 0	28 38		
6	4 20	2	21 10	28 22	5 18	2	22 38	27 56		
7	3 56	2	23 10	27 20	4 25	2	24 30	26 27W	Bound for Cape Bon Esperanza.	
9					3 0	1	26 35	23 31		
10	2 50	2	26 56	22 15						
11	1 56	2	27 7	21 26						
12	1 33	2	27 36	20 17						
13	1 8	2	29 10	17 0	1 0W	2	29 40	14 12		
15	1 31W	2	30 10	11 27						
17	3 48	3	32 40	6 20	5 23	3	33 12	4 12		
19					7 50	3	34 2	2 30E		
21	9 52	5	34 20	7 10E						
24	13 24	2	33 32	14 40	13 22	3	33 58	15 20		
25					14 12W	3	34 9	17 4		

1721 May	Var. P.M.	N Var. N	Lat.	Long <sup>de.</sup>	Var. A.M.	S Var. S	Lat.	Long <sup>de.</sup>	
26									Anch'd in Table Bay, at Cape Bon Esperanza. By my reckoning I make the Table Land to ly in 18 10 E. from London.
June 16	25 W	11							Taken as we lay at anchor in Table Bay. I judge there is something draws the compass.
14	14 25	2							Cape Bon Esperanza S. 5 or 6 lgs.
18	19 0	3 35 20 S	28 53 E	20 10 W	3 35 16 S	30 10 E			Lat. of the Cape 33 25 S. Long <sup>de.</sup> E. from London 17 25.
19	20 45	4 35 14	31 12						Bound for Madagascar.
20				21 13	3 34 0	34 10			
22				22 35	3 32 2	35 38			
24				22 45	2 30 51	36 10			
25				22 40	3 30 39	36 17			
26	23 3	2 30 30	35 47	22 51	2 29 53 S	36 26			
27	22 32	1 29 40	36 2						
28				22 24	2 27 33	37 12			For Madagascar.
29	23 43	2 26 38	37 34						
July 3	23 51	3 24 14	45 30						
4	24 17	4							St. Augustin's Bay on Madagascar E. $\frac{1}{2}$ S. 5 or 6 lgs.

1721 July	Var <sup>n</sup> . P.M.	N. of Obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. of Obs.	Lat.	Long <sup>de</sup> .	
	23 18W	8							Taken as we lay at anchor in St. Augustin's Bay on Madagascar. I make St. Augustin's Bay on Madagascar to lye in 23 30 S. pr <sup>r</sup> obs <sup>n</sup> . Long <sup>de</sup> Et. from London, by my reckoning, 46 21.
15 23 27	2 21 40S	45 36E	22 35W	3 21 10S	45 40E				The nearer to the land the less var <sup>n</sup> .
16 23 51	2 20 47	45 57							
17 24 25	4 20 22	46 23							I take the land, called Westminster Hall near St. Augustin's, to lye in 23 38 S. and Et. long <sup>de</sup> from London, 46 45
19 21 44	3 20 20								
20 22 13	4 19 48	46 8							Lat: of the mouth of Timerly river 29 20 obs <sup>n</sup> . Long <sup>de</sup> Et. from London, by my reckoning, 46 40.
21 22 22	1 18 17	45 18							Bound for the Island Joanna.
22 21 25	2 17 15	45 18	21 20	1 16 25	45 6				
24 21 33	3 15 0	45 26							
25 21 16	3 13 35	46 29							
29 20 33	4								In Joanna Bay.
Aug. 2	19 12	3							Center of the Island Comaro, S.W. by W. 4 or 5 lgs.
3 19 44	5				19 4	3			Center of the Island Comaro S.S.W. 10 lgs. Center of Comaro S. $\frac{1}{2}$ W. 18 lgs.

A g.	Var <sup>n</sup> . P.M.	N <sup>o</sup> of Var	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>o</sup> of Var	Lat.	Long <sup>de</sup> .	
4					19 2W	1	10 18S	44 57E	Mean of the evening and morning. Lat. of the center of Comaro 11 44 S. long <sup>de</sup> . E. from London 45 17.
5					18 27	2	9 34	44 58	
6					18 23	2	8 28	45 10	Bound for Cape Gardafoy near the Red Sea.
7 18 33W	4	7 36S	45 24E	17 20	2	6 28	45 36		
9					16 17	2	2 2	47 55	
12 13 48	1	3 5N	51 17						
13 13 19	3	5 25	51 41						
14 11 39	2	8 45	51 11	11 14	1	9 10N	51 30		P.M. Nearest land on the Ethiopian Coast W.N.W. 3 lgs. A.M. Nearest land N.W. by N. 4 lgs.; very cold.
15				11 0	3	10 6	51 54		Nearest land ditto Coast N. by W. 4 lgs.
16				11 11	3				Mount Felix at the mouth of the Red Sea W. $\frac{1}{2}$ N. 5 or 6 lgs. I make Cape Gardafoy, at the mouth of the Red Sea, to ly in 11 40 N. and E <sup>c</sup> long <sup>de</sup> . from London 52 30.
18 11 49	4	12 36	53 10						I take Cape Gardafoy to ly in 11 45 N. and E <sup>c</sup> long <sup>de</sup> from London 52 50.
19 11 0	2	13 10	55 37						Bound for Bombay.
20 9 42	2	14 48	58 45						

Aug. 1721	Var. P.M.	N 30° 09' 09"	Lat.	Long <sup>de.</sup>	Var. A.M.	N 30° 09' 09"	Lat.	Long <sup>de.</sup>	
21	8 28W	2 16 14N	61 37E						
23	7 7	5 18 20	65 35						
24				5 35	2 19 16	68 10			
27	5 12	3							The Low Land to the S <sup>rd</sup> of Valentine's Peak E <sup>t</sup> . 3 lgs. near Bombay.
Sept.									
12	5 16	2							Taken without the W <sup>t</sup> gate on the Island Bombay.
	5 13	3							Taken aboard.
Oct.	5 27	3							Taken in the road by Choul; this is about 10 or 12 lgs. to the S <sup>rd</sup> of Bombay.
	5 19	1							Island Calaba E.S.E. 2 lgs. This island is about 8 lgs. to the S <sup>rd</sup> of Bombay.
172 $\frac{1}{2}$ Feb.									
1	4 58	2 17 0							In sight of Rogipore Island. Bound for Goa.
	4 5 49	3							Algurda by Goa S.E. 3 or 4 lgs.
	5 5 25	3							Cape Ramas near Carwar, S.E. by E. $\frac{1}{2}$ E. 3 or 4 lgs.
	7 5 40	2							The W <sup>t</sup> ermot point of Carwar Bay N. by W. 7 or 8 lgs.
	9 5 24	2							The W <sup>t</sup> ermot rocks near Manqulor N. $\frac{1}{2}$ W. 3 lgs. This place lies to the S <sup>rd</sup> of Baffore, about 9 lgs.

172 <sup>1</sup> Feb.	Var <sup>n</sup> . P.M.	N. 39°0'.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. 39°0'.	Lat.	Long <sup>de</sup> .	
10 11	5 35W 5 35W	8							At an anchor in Manqualore Road.
13	4 21	8							In Tellicherry Road.
18	4 5	3							In Calicut Road.
19	3 34	4							Cochin Fort N. by E. $\frac{1}{2}$ E. 4 lgs.
22	4 26	3	6 38N	77 56E					I take Anjanga to ly in 8 48N. and E. long <sup>de</sup> . from London, 77 12.
23					4 0W	6	5 24N	78 24E	Bound for the Island Mauritius.
24	3 24	4	4 48	78 41					
25					3 9	2	3 55	78 38	
26	3 36	5	3 24	78 34					
27	3 3	2			3 8	1			At equal altitudes, having run but 7 mile. Mean of evening and morning.
28	2 53	3	3 16	78 4	3 7	2	3 13	78 10	
Mar.									
1	2 35	2	3 5	78 24	2 48	3	2 48	78 34	
2	2 16	2	2 28	78 40	3 0	3	2 0	78 47	
3	2 20	5	1 28	78 53	3 4	3	0 50	79 0	
4	2 14	4	0 28	79 9	2 8	2	0 14S	79 14	
5	1 36	2	0 54S	79 20	2 10	3	1 10	79 24	
6	2 2	2	1 20	79 30	2 16	3	1 30	79 40	

1722 Mar	Var <sup>n.</sup> P.M.	N 190505	Lat.	Long <sup>de.</sup>	Var <sup>n.</sup> A.M.	N 190505	Lat.	Long <sup>de.</sup>	
7	1 48W	2	1 52S	79 8E					
8	2 28	2	2 45	79 36	2 46W	2	2 58S	79 36E	
9					3 6	3	4 12	79 48	
10	2 41	3	4 46	79 57	3 9	2	5 10	80 5	
11					3 24	1	5 36	80 22	
12					3 14	1	5 27	80 30	
13	2 54	2	5 27S	80 22	3 0	1	5 55	80 10	
14	3 15	2	6 26	80 2	3 28	1	7 2	79 45	
16	3 42	2	9 8	79 7					
17					5 20	2	11 36	78 30	
18	4 56	1	12 16	78 20	5 12	1	13 0	77 56	
19	5 8	2	13 50	77 20	6 15	2	15 0	76 24	
20	6 22	2	15 50	75 32	7 12	2	16 50	74 30	
21	7 26	2	17 40	73 22					
23					14 27	4	20 20	68 3	I can give no reason that the variation has risen so much. 2° 40' difference lat. and 4° 19' difference of long <sup>de.</sup> . The var <sup>n.</sup> has altered 7° 1'.
25					16 27	3	23 35	63 24	
26					17 44	1	20 41	61 6	
1722 27	17 37	4	20 42	60 57	18 47	4	20 35	59 34	

1722 Mar.	Var <sup>n</sup> . P.M.	N. S.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. S.	Lat.	Long <sup>de</sup> .	
28									Between 4 and 5 P. M. saw a round island, which lies near the island Mauritius. I make this island to ly in the long <sup>de</sup> . of 48° 42' E. from London. I judge that this island and Don Mascareen ought to be laid down 3 degrees more to the Eard than most our books lays them in, for we often tryd the current.
Apr. 1722	18 46W	5							Taken at Peter Butts Bay, and this is about 4 mile to the Nord of N.W. harbour on Mauritius.
5	18 22	1			18 56W	1			The largest of the 2 round islands near Mauritius S.W. $\frac{1}{2}$ W. 41° A.M. do island W. by S. $\frac{1}{2}$ S. 4 lgs.
6					19 7	1			D <sup>o</sup> island 8 or 9 lgs.
7					19 45	3			D <sup>o</sup> island N by W. 12 lgs. Bound for the Island Don-Mascareen.
8					19 49	2			The SE pt of Don Mascareen W.S.W. 6 or 7 lgs.
10	19 44	1							In St. Paul's Bay at Don-Mascareen.
13	19 49	2	19 12S	52 11E					I take St. Paul's Bay to ly in 20° 58' S <sup>o</sup> . and E. long <sup>de</sup> . from London 54° 10'. Bound for the Island St. Mary by Madagascar.
18	19 53	1							Charrock Point on Madagascar by W. 1 m. Long <sup>de</sup> . of the No. end of St. Mary's 48° 41', by my reckoning.

Apr. 1722	Var. P.M.	N. 19 05S	Lat.	Long. <sup>dc.</sup>	Var. A.M.	N. 19 05S	Lat.	Long. <sup>dc.</sup>	
19					19 52W	1			At Charrock Point on Madagascar.
22	19 25W	2				2			At anchor at the mouth of St. Mary's harbour.
May	2 18 30	2	13 34S	52 35E					Bound for Cape Amber, which is the N. E. pt. of Madagascar.
	3 19 1	5							Cape St. Sebastian on the N <sup>o</sup> end Madagascar, S.W. $\frac{1}{2}$ S. 4 or 5 lgs.
	4 18 36	3							Cape Sebastian, E. by N. 9 lgs.
	5 19 48	3	13 0		20 12	1 13	8S		The great island Noffee, E. $\frac{1}{2}$ S. 5 lgs.
	6 19 45	3							The E <sup>term</sup> ost of the Ild Noffee, E. by N. 6 lgs.
	7 19 5	3	13 34						Do Island E.N.E. 10 or 11 lgs.
	8 19 20	3	13 56						We are to the Sord of Maringambo Harbour.
	9				20 16	3 14 51			To the N <sup>ord</sup> of Soundjee point.
	10				20 24	2 15 21			Near Maringambo Harbour. Mean of the evening and morning.
	11 21 18	4							Mean of the morning and evening. At an anchor in the outer bay of Manigaro.
	14 21 14	4							Near New Masseleage. Mean of the evening and morning.

I 7 2 2 May	Var <sup>n</sup> . P.M.	N. 90°	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. 90°	Lat.	Long <sup>de</sup> .	
	15 21 37W	2							Jamgomy Island S. by W. 5 lgs. Going back to Manigaro Harbour.
	16 20 51	4							Near Manigaro Harbour.
18 to 21	21 22	7							At an anchor in the inner bay of Manigaro.
June 7	21 43	1			21 14W	2	14 37	46 40E	Mackamoy Ild S.W. by S. 7 lgs. Bound for the Island Joanna. Lat. of the N.W. part of Ma- nigaro Harb. 15 45 S <sup>o</sup> obs <sup>n</sup> . Long <sup>de</sup> . E. from London 47 26.
	8 21 12	2			20 24	1			Saw Valentine's Peak on the Island Mayota N.N.E. 14 lgs. Long <sup>de</sup> . 45 45 E. Valentine's Peak N. by E. 6 leagues.
12	20 39	2							At an anchor in Joanna Bay, and with the same compaſs I observed here in June last. By another compaſs.
	20 33	2							
18	19 18	3	9 54S	45 34E	18 54	3	8 47	45 23	Lat. of the N.Et. part of Jo- anna 12 2 S. Long <sup>de</sup> . Et. from London 46 0, as I take it.
19	18 11	3	7 48	45 14					Bound to Fort St. George by the N <sup>o</sup> . end of the Maldivē Islands.
20	16 48	1	5 24	45 0					
21	16 15	2	2 26	45 56					
22	15 34	3	0 35	48 21					
23	15 4	2	0 18N	51 4					

1722	Var <sup>n</sup> . P. M.	N <sup>o</sup> of Obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>o</sup> of Obs.	Lat.	Long <sup>de</sup> .	
June									
24	13 59W	2	2 10N	54 10E					
25	12 43	3	3 16	57 2					
27	10 38	2	5 36	62 4					
29	9 11	2	8 34	66 45					
30	7 6	5	7 59	69 50					
July									
1	7 8	4	7 53	71 44					
2	7 6	3	7 46	72 16	6 45W	1	7 42N	72 35E	
4	5 54	5	7 15	74 6	5 32	2	7 13	74 40	
5	4 56	3	7 10	75 22	5 0	1	7 0	76 10	
6	4 7	4			4 25	1			At equal altitudes evening and morning. In sight of the N <sup>o</sup> . end of the Maldives. I make the N <sup>o</sup> ermost of the Maldivian Islands to ly in 7 12 N, by a good obs <sup>n</sup> , and I make it ly in 77 15 E. from London. A fair wind all the way; but this is about 4° to the E <sup>t</sup> ard of what our books lays it in; and its my opinion, that Mauritius and Don-Macareen, and the N <sup>o</sup> . end of Maldives ought to be laid down about 3° further to the E <sup>t</sup> ard than they are.
7					4 43	3	7 5	0 49 E <sup>t</sup> from the N <sup>o</sup> most Maldivian Islands.	
9	2 52	5	5 38	4 12E from the N <sup>o</sup> most of the Maldivian Islands.					

1722 July	Var <sup>n</sup> . P.M.	N. of obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. of obs.	Lat.	Long <sup>de</sup> .	
10					2 13W	3	5 49N	7 43E from the N <sup>o</sup> most of the Maldi- vees	A little after observ <sup>n</sup> . saw the Island of Zeloan. Note, I have made 7 56 long <sup>de</sup> between the N <sup>o</sup> end of the Maldivees and the land cal- led the Elephant on Zeloan.
11					2 12	1			Fryers Hood on the S.E. part of Zeloan W.S.W. 8 lgs.
12	2 15W	1	8 30N		2 36	2 10 2		10 48W from Fry- ers Hood on Zeloan.	
July	2 52	9							At Fort St. George or Madcraf <sup>s</sup> .
29	1 42	2	16 20	3 38E from Fort St. George.	1 32	1 17 0		4 16E	Bound for Balasore. The nearer the land I find the less variation.
30	1 38	1	18 3	4 41E from Fort St. George.					Note, I have made 5° 5' long <sup>de</sup> . between Fort St. George and Jackernat Pa- goda.
Aug. 7ber 8ber	3 4	26							At an anchor before the mouth of Rogues river; and, as I was informed, this is about 4 lgs. from the mouth of the Ganges.
28	3 33	2							Cape Palmiras near Balasore W. $\frac{1}{2}$ N. 4 lgs. Bound for Surrat.
29	3 0	1	18 56	0 9W from Cape Palmiras.					
31	3 17	2	14 50	2 5W from ditto.					The compasses new touched.

1722 obre	Var <sup>n</sup> . P.M.	N or S	Lat.	Long <sup>dc</sup> .	Var <sup>n</sup> . A.M.	N or S	Lat.	Long <sup>dc</sup> .	
1 2 14W	1	12 53N	2 54W	2 2W	2 12 ON	3 17W <sup>t</sup> from Palmiras.			
2 2 48	2	11 12	3 35						
4 2 21	2								Fryers Hood on Zeloan SW $\frac{1}{2}$ W 8 lgs. Note, I have made 4° 38' long <sup>dc</sup> , between Cape Palmiras and Fryers Hood on Zeloan.
5 2 36	1	5 44	O 23W from Fry- ers Hood.						
11 4 11	3	9 14							Near Porcat, a Dutch factory on the coast of Malabar.
12 4 13	3								The ships in Cochin road N. by E. 4 or 5 lgs.
13 3 34	3								Cochin Fort E.N.E. 2 lgs.
14 3 14	4								We are about midway between Pansan Factory and Calicut.
15 4 9	3								In Calicut Road.
16 3 44	3								Sacrifice Rock S.S.W. $\frac{1}{2}$ W. 4 mile. This rock is about 4 or 5 lgs. to the Sord of Tellicherry.
19 4 4	3								Tellecherry Fort S. E. by E. 5 lgs.
21 5 20	3								Saw Pidgeon Island from the maff-head N. by W. 10 lgs. Mallappy Hill E.N.E.
22 4 43	2								Pidgeon Island S. by E. 6 lgs.

1722 9ber	Var <sup>n</sup> . P. M.	N. S. 90°	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. S. 90°	Lat.	Long <sup>de</sup> .	
23	5 4W	3							In Carwar Bay.
25	4 37	4							Carwar Bay S.E. by S. $\frac{1}{2}$ E. 4 lgs.
26									
27	4 57	8							In Goa Road.
28									
30	4 56	2 16 6N							About 8 lgs. to the Nord of Vingorla Rocks.
xber. I	4 47	2 16 24							The mouth of Careptam Harbour E. by S. 3 mile.
2	4 50	2 16 50							Cape Dobs N.N.E. 5 lgs.
4	4 43	2 17 45							Sevendruke N.E. by E. 3 lgs. This is a rock fortified by Angria, and is about 4 lgs. to the Nord of Setra River.
5	4 50	3 17 55							Nearest land E.N.E. 6 lgs.
6	5 16	3							Island Canary near Bombay N. $\frac{1}{2}$ E. 7 lgs.
9	5 28	2							The land called the Neats Tongue E. by S. 8 lgs. Bound for Surrat.
10	5 36	1 19 37							Nearest land E. 5 lgs. Between Bombay and St. Johns.
11	5 27	3							The high land of St. Johns S.S.E. 5 lgs. from the nearest land.
12 to 20	5 50	17							In Surrat Road.

## Mr. DOUGLASS's Observations of

Var. 1722 xber.	Var. P.M.	N. 2 Jgo	Lat.	Long <sup>de</sup> .	Var. A.M.	N. 2 Jgo	Lat.	Long <sup>de</sup> .	
22	5 23W	2							Demaen E.S.E. 4 or 5 lgs. Bound for Bombay
23	5 26	2							The Neats Tongue S.E. by E. 7 lgs.
29 to 31	5 7	6							At Bombay.
Feb. 5 to 9	5 59	7							In Surrat Road.
1722 <sup>2</sup> 14	5 30	1							We are about 7 or 8 lgs. to the Sord of Dundee Rogipore. Bound for Goa.
15	5 5	1 16 14N							We are a little to the Sord of Careptam Harbour.
17 to 19	5 13	5							In Goa Road.
24	5 8	3							In Carwar Bay.
25	5 5	1							The Soermolt part of Carwar Bay N. $\frac{1}{2}$ W. 5 lgs.
27 28 Mar. 1	5 5	8							In Mangulore Road.
3 4	4 9	3							In Tellecherry Road.
7	4 22	2 11 18	75 30E from London.						I take Sacrifice Rock to ly in 11 30 N. and Et. long <sup>de</sup> from London 75 38.
8	4 51	3 10 35	74 32						Bound for the Island Saccatra.

1723 Mar.	Var <sup>n</sup> . P.M.	N. 90°	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. 90°	Lat.	Long <sup>de</sup> .	
9	5 11W	2	9 54N	72 55E					Island Qualpenna 10 0 N. obs. Long <sup>de</sup> . E <sup>r</sup> . from London 73 20.
10	5 24	1	9 43	72 25					
11	5 46	1	10 6	72 21					
13	6 3	3	9 54	71 32					
14	5 43	2	9 46	71 17					
15	5 44	1	10 0	71 17					
16	5 38	1	9 38	70 55					
19	7 14	2	9 12	68 5	7 0W	1	9 25N	67 29E from London	
20	7 11	2	9 25	67 10	7 58	1	9 40	66 40	
21	8 30	2	9 45	66 9	8 22	1	9 54	65 28	
22	8 42	1	10 0	64 55					
23	9 16	2	10 37	63 53	8 33	2	11 12	63 27	
24	9 28	3	11 20	63 0	9 24	2	11 36	62 30	
25	9 54	4	11 40	62 3	9 45	2	12 0	61 20	
1723 26	10 12	2	12 10	60 53	9 48	1	12 20	60 11	
7					9 41	2	1	59 21	
28					9 48	2	12 21	59 30	

1723 Mar.	Var. <sup>n.</sup> P. M.	N. J9O9	Lat.	Long <sup>de.</sup>	Var. <sup>n.</sup> A.M.	N. J9O9	Lat.	Long <sup>de.</sup>	
29	9 16W	1	12 30N	59 30E	9 18W	4	12 22N	59 20E from London.	
30	9 29	2	12 28	59 17	10 8	1	12 23	59 13	
31	9 48	1	12 32	59 12					
Apr.					10 6	1	12 45	58 19	
2	10 40	1	12 50	57 40	10 39	2	12 50	56 57	
3	10 45	2	12 48	56 0	11 26	1	12 44	54 45	
4	11 16	2	12 36		11 33	1			The Et. end of the island Saccatra W. $\frac{1}{2}$ N. 9 lgs.
5	11 36	1							Et end of Saccatra S.E. by S. 5 lgs. Note, I have made 21° 8' of long <sup>de.</sup> between the island Qualpenna and the Et. end of Saccatra; but as those places is laid down in books, I should not have made so much by about 2°. Lat. of the Etmost point of Saccatra 12 20 N. obs.
8	11 38	4							At an anchor before the town of Saccatra, which stands on the N <sup>o</sup> . side of the island.
10	12 4	1							Lat. of the town 12 20 N. obs. The Wt. end of Saccatra S.W. $\frac{1}{2}$ W. 5 lgs.
11	11 54	2							The mean between the morning and evening. At equal altitudes morning and evening.
	12 0								

1723 Apr.	Var <sup>n</sup> . P.M.	N Tqo obs	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N Tqo obs	Lat.	Long <sup>de</sup> .	
12	12 43W	2							The Et. end of the island Abdchura S. by E. 10 lgs.
13	12 18	2							Mount Felix Et S <sup>o</sup> erly 5 lgs.
14	12 16	2	11 36N from Mount Felix.	1 0W					
15	12 58	1	11 25	2 15	12 32W	1	11 46N	3 6W from Mount Felix.	
16					13 4	2	12 36	4 38W from D <sup>o</sup> .	
17	12 37	3	12 50	4 48W from D <sup>o</sup> .					
18	13 50	2			13 40	2	12 36	0 56W from Cape Aden.	Cape Aden N.E. $\frac{1}{2}$ N. 5 lgs. This Cape ought to be laid down a degree more to the W <sup>ard</sup> than it is.
19	14 20	1							Taken in the narrow straits of Babelmandel.
20 to 27	13 34	7							In Mocha Road in the Red Sea.
May 14	14 1	1							Zee Hill near the narrow straits of Babelmandell E. by S. $\frac{1}{2}$ S. 2 lgs.
15	14 8	1							The middle of the narrow straits of Babelmandell S. by E. 2 lgs.

1723 May	Var <sup>n</sup> . P.M.	N. or S. of Eq.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. or S. of Eq.	Lat.	Long <sup>de</sup> .	
19	13 54W	1							The highest land of Cape Aden N.W. $\frac{1}{2}$ W. 5 lgs.
20	13 42	1							Cape Aden W. N. W. $\frac{1}{2}$ N. 9 lgs.
21	13 25	2	12 32N	0 30E from Cape Aden.					
22	13 10	1	12 16	1 0E from D°.					
23	13 6	1	11 56	2 4E from D°.					
24	13 23	2	11 58	2 30					
25	12 39	2	12 4	3 12					
27	13 3	3							Within 5 or 6 lgs. of the Ethi- opian shoar.
28	12 0	2							About 3 or 4 lgs. from Mount Feeelix. Note, I made 6° 14' long <sup>de</sup> from Mount Feeelix to Cape Aden, and in coming back 6° 21.
29	12 34	2							Cape Gardafoy S.E. $\frac{1}{2}$ E. 5 lgs.
31	12 20	2							The town of Saccatra S.W. by W. 6 lgs.
June 4	8 26	1	9 50	66 50E from London.					I take the E <sup>t</sup> . end of the island Saccatra in 12 20 N. obs. and E <sup>t</sup> . long <sup>de</sup> . from Lon- don 56 22.

1723 June	Var <sup>n</sup> . P. M.	N. of O <sup>dg</sup> .	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. of O <sup>dg</sup> .	Lat.	Long <sup>de</sup> .	
	5 7 34W	2	8 40N	69 14E					Bound for Fort St. David's on the Coast of Cormandel by the N <sup>o</sup> . end of the Maldiver Islands. Note, I have made 20° 38' long <sup>de</sup> . between the E <sup>t</sup> . end of the Island Saccatra and the N <sup>o</sup> rmost of the Maldiver Islands; and this makes the N <sup>o</sup> rmost island to ly in 77 ° E. from London; and in sailing from the Island Joanna to this N <sup>o</sup> rmost island I made it ly in 77 15'. Note, we had a fair wind both voyages.
11	2 2 2	2	5 53	7 4E from the N <sup>o</sup> rmost of the Maldiver Islands.					In the morning saw the Island Zeloan to the W <sup>t</sup> ard of Dondra-Head. of long <sup>de</sup> . between the N <sup>o</sup> rmost of the Maldiver Islands and Dondra-head on the Island Zeloan 7° 46'. Fair wind all the way.
29	2 25	4							At Fort St. Davids. Mean of the evening and morning.
July 15 17	3 16	4							At Fort St. George or Madras.
8ber 14	2 6	3			2 8W	1	5 23N		Dondra Head (N.E. $\frac{1}{2}$ E. 6 lgs.) on Zeloan. In sight of Zeloan.
15	2 46	1							The Dutch factory at Point de Galle on Zeloan N.N.E. 2 lgs.
16	2 45	2							A land that appears like a hay-cock near Pt. de Galle on Zeloan E. $\frac{1}{2}$ S <sup>o</sup> . About 6 lgs. from the nearest land.

1723 8ber.	Var <sup>n</sup> . P.M.	N. 1905	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. 1905	Lat.	Long <sup>de</sup> .	
17	2 44W	1	7 20N	○ 53W from Point de Gallee.	2 52W	1	7 54N	1 22W from Point de Gallee on Zeloan.	Bound for Bombay.
18	2 51	3			2 48	3			The high land of Cape Came- roon W. 10 lgs. Cape Cameroon W. by N. $\frac{1}{2}$ N. 10 lgs.
19	2 50	1							The high land over Cape Cameroon, W.N.W. 6 lgs.
20	3 9	1							Cape Comaroon N.N.W. $\frac{1}{2}$ W. 3 or 4 lgs.
21	2 58	2							Do. Cape Et. 4 or 5 lgs.
9ber									Manqulore E. by N. $\frac{1}{2}$ N. 3 or 4 lgs. On the Malabar Coast.
1	5 8	2							Bassalore Hill N.E. We are about 5 lgs. from the nearest land.
3	4 48	2							The Soermost part of Carwar Bay N. 6 lgs.
4	5 48	4							Cape Ramas E. by N. 2 lgs. Here there is something that draws the compass.
6	5 3	4							At Goa.
9	5 20	3							Rogipore N.E. $\frac{1}{2}$ E. 5 or 6 lgs.
10	5 28	2							Cape Dobbs E. by N. 2 lgs.
12	5 25	3							Island Canary near Bombay N. by E. $\frac{1}{2}$ E. 6 lgs.

1723 9ber	Var <sup>n</sup> . P.M.	N. of deg.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. of deg.	Lat.	Long <sup>de</sup> .	
13	5 10W	2							Going into Bombay.
xber									
17	5 48	4							In Surrat Road.
18									
xber	5 22	1							At Bombay.
172 <sup>3</sup> Jan.	5 41	3							At Goa.
5	5 32	2							In Carwar Bay.
6	5 33	2							Pidgeon Island S.E. by S. 3 lgs
9	2 46	1							Mount Dilla near Tellecherry E N.E. 2 mile. Here its plain that being near the land the compass is drawn.
10									
11	4 34	6							In Tellecherry Road.
12									
16	3 41	1							Note, I have all along observed that the variation decreases after you pass Tellecherry, till you are 4 or 5 lgs. to the Sord <sup>r</sup> of Cochin; then increases again till you are to the Sord <sup>r</sup> of Anjanga.
18									
19	3 26	2							In Cochin Road.
21	4 16	1							Cochin Road N.E. $\frac{1}{2}$ E. 4 or 5 lgs.
22	4 38	1	9. 20N						About midway between Cochin and Anjanga.

172 <sup>3</sup> Feb.	Var. P.M.	Var. N. of 1900	Lat.	Long <sup>de</sup> .	Var. A.M.	Var. N. of 1900	Lat.	Long <sup>de</sup> .	
24	4 17W	4				1			In Anjanga Road. Under fail.
27	3 53	3	3 24N	78 12E <sup>t</sup> from London.	3 10W	1	2 15N	78 30E	I make Anjanga to ly in 8 45 N. Long <sup>de</sup> . E. from London 77 12.
29					2 54	2	2 38S	79 55	Bound for Cape Bon-Esperanza.
30					3 17	2	5 0	80 26	
Feb.									
1	3 55	2	7 57S	81 28	3 22	2	8 46	81 52	
2	4 13	3	9 30	82 6					
3	4 33	5	10 52	82 14	4 12	2 11 14	82 40		
4					5 5	4 11 34	82 53		
5	4 51	3	11 42	83 3					
6	4 51	3	11 35	83 21					
7	4 40	2	12 4	82 57					
8	4 55	4	13 52	81 30					
9	5 39	2	15 18	80 5	6 22	1 16 2	79 26		
11	8 28	2	18 20	76 10	9 38	4 19 2	74 42		
12	10 30	4	19 38	73 28	12 8	1 20 20	72 13		
13	13 2	3	20 40	71 4	13 59	2 21 10	69 49		
14	14 49	2	21 30	68 50	15 58	1 21 52	67 46		
15	16 19	3	22 8	67 0	16 52	4 22 34	66 10		
16	16 55	3	22 46	65 41	17 30	1 23 5	65 18		

17 23 Feb.	Var <sup>n</sup> . P.M.	N. 90°	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. 90°	Lat.	Long <sup>de</sup> .	
17	17 35W	2 23 12S	65 4E						
18	17 50	2 23 58	64 40	18 56W	4 24 15S	63 28E			
19	20 0	2 24 33	62 15	21 13	3 25 5	61 18			
20	22 12	2 25 44	60 30	22 8	2 26 18	59 25			
21	22 22	3 26 44	58 47	23 15	2 27 22	57 50			
22	23 30	1 27 50	57 0						Bound for Cape Bon-Esperanza.
23	24 13	2 28 40	55 24						
24	25 5	2 29 23	52 47	24 34	2 29 50	51 38			
25	25 29	4 30 20	50 19	25 55	5 30 50	48 41			This is the greatest variation we met with.
26	25 25	4 31 12	47 28	25 0	1 31 33	46 17			
27	25 32	6 31 58	44 57	25 12	1 33 22	43 43			
28	25 2	2 32 40	42 51	24 31	2 33 12	40 48			
29	23 50	2 33 38	39 10						
Mar.									
5	22 6	4 35 42	30 48						
6	21 54	1 36 25	29 43	22 4	1 36 12	29 17			
8	20 54	4 35 58	27 8	19 31	4 36 0	25 33			
9	20 0	3 36 28	24 57						

1724 Mar.	Var <sup>n</sup> . P. M.	N. 39°0'	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. 39°0'	Lat.	Long <sup>de</sup> .	
12	18 43W	4	36 40S	22 50E	18 56W	2	36 10S	21 38E	
13	18 16	2	35 57	20 47					
14	17 3	6	36 8	18 24	16 53	3	36 6	18 4	
15	16 23	3	36 6	17 53					
16	16 12	4							Cape Falso near Cape Bon-Esperanza N.W. 6 lgs.
21 to 29	16 27	8							In Table Bay at Cape Bon-Esperanza. The fort S.S.W. 2 mile.
26 to 29	16 18	5							By another compas.
31	16 15	2							Going out of Table Bay. The fort S.S.W. $\frac{1}{2}$ W. 6 or 7 mile.
Apr. 1	15 8	2	32 47	15 36					Lat. of the Table land 54 16' S. Long <sup>de</sup> E. from London 17 24.
2	15 15	2	32 44	14 50					
3	14 59	1	32 0	14 36	14 51	2	31 26	14 27	
4	14 33	3	31 20	14 34					
5					14 27	3	29 31	13 55	
6	14 30	6	29 0	13 34					Bound for St. Helena.
7	13 0	2	27 15	11 22					
9	11 40	2	23 8	6 29	12 4	4	22 20	5 37	

1724 Apr.	Var. P.M.	N. S. E. W.	Lat.	Long. <sup>de.</sup>	Var. A.M.	N. S. E. W.	Lat.	Long. <sup>de.</sup>	
10	12 2W	6	21 56S	5 0E					
13	10 47	2	17 54	1 0	10 10W	2	16 55S	0 8W	
14					9 30	2	16 4	2 48	
15					8 6	1	15 54	4 47	
16	7 18	3							The center of the island Wt. Nerly 6 or 7 lgs. I make St. Helena to ly in 6 16 W. from London, by my reck- oning.
17 to 26	7 42	5							In St. Helena Road.
24	7 26	2							By another compas.
30	7 22	1							St. Helena Fort S.E. 3 lgs.
May 1	7 30	1	14 36	7 32W from London.					I take St. Helena Fort to ly in 16 0 So. and Wt. Long <sup>de.</sup> from London 6 5.
2	6 54	4	13 26	8 36					Bound for England.
4	5 44	4	10 36	11 6					
5	5 27	6	9 4	12 24					
6	5 1	2	7 18	13 55					
7	4 37	2	5 30	15 21					
8	4 46	1	3 46	16 17					
9	4 16	1	2 6	16 50	3 48	1	1 14	17 8	
11	3 40	1	1 0N	17 40	3 39	2	9N	17 49	

1724 May	Var <sup>n</sup> . P.M.	N <sup>r</sup> of Obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>r</sup> of Obs.	Lat.	Long <sup>de</sup> .	
12	3 34W	1	3 8N	17 57W	2 56W	2	4 6N	18 5W	
16					3 29	2	9 28	18 57	
17	3 55	4	9 46	18 53					
18	4 26	1	10 20	9 31					Bound for England.
19					3 18	1	11 18	20 40W from London.	
20	3 55	3	11 39	21 13	3 38	2	11 30	21 46	
21	3 38	2	11 28	22 16					
23	2 26	1	12 0	23 59					
24	2 45	3	13 8	25 1					
25					2 15	2	14 30	26 29	
27	2 46	3	16 0	28 10					
28	2 8	5	17 23	29 17					
29	2 43	2	18 42	29 22					
30	3 26	4	19 58	31 14					
31	3 12	6	21 25	31 41					
June									
1	2 48	6	22 25	32 15					
2					3 29	3	25 5	32 8	

1724 June	Var. P.M.	N. or S.	Lat.	Long <sup>de.</sup>	Var. A.M.	N. or S.	Lat.	Long <sup>de.</sup>		
									Var. P.M.	Lat.
3	3 39W	3	25 44N	33 30W						
4	4 22	2	26 31	34 23						
5	5 8	5	27 18	35 5	4 37W	2	27 43N	35 29W		
6	5 15	4	28 6	36 0						
7	5 30	3	28 56	36 22						
8	5 41	3	29 16	36 23						
9					5 42	1	30 24	36 40		
10	6 10	5	30 46	36 52	5 58	2	31 14	37 15		
12	6 57	4	32 26	38 13						
13	7 15	2	32 58	39 3						
15	7 19	4	34 30	40 30						
16	7 47	4	35 46	41 14						
17	8 29	4	37 0	41 39						
18	8 55	3	38 40	42 4						
19	8 21	5	39 33	40 37						
20	8 52	4	40 42	38 37						
21	9 16	3	41 43	36 5						
22	9 37	3	42 26	33 41						
23	9 38	2	43 34	31 7						

1724 June	Var <sup>n</sup> . P.M.	N. S. of Obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. S. of Obs.	Lat.	Long <sup>de</sup> .	
24	10 38W	6	44 16N	28 26W					
25	11 28	1	44 30	28 5					
29	11 14	2	45 26	27 22					
30	11 50	4	46 0	25 18					
July									
1	11 55	6	46 34	23 14					
2	11 51	1	46 54	21 54					
3	12 10	1	47 32	19 33					

Note, The Bill of Portland was the first land we made, and I am about  $\frac{1}{2}$  a degree further to the E<sup>t</sup>ard then it is laid down in our books.

The VARIATION of the COMPASS in a voyage to Guinea, W<sup>t</sup>. Indies, and back to England, in the Kinsale.

1725 8ber.	Var <sup>n</sup> . P. M.	N. 90°	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. 90°	Lat.	Long <sup>de</sup> .	
5	3 32W	1							The Peakt Hill on the Isle of Mayo S.S.E.; we are about a mile from the shore.
7 8	4 5	4							At anchor in Port de Prya Bay on the S.E. part of the Island St. Jago.
11	4 36	2 14	0N	20 0W from London.					Bound for Cape de Verd, Lat. of Pott de Prya Bay 15 10N. obs <sup>n</sup> . Long <sup>de</sup> . W <sup>t</sup> . from London 23 42.
12	5 4	2	13 33	18 36					
13	5 21	3	13 44	17 30					At noon saw Cape de Verd N.N.E. 3 lgs.
14	5 11	1	13 53						In sight of Gambia River.
15	6 29	2							Cape St. Marys near Gambia River S.W. 5 or 6 lgs.
to 21	6 19	8							At anchor in the mouth of Gambia River.
25	4 36	1 11	6	16 12	4 59W	2	10 42N	15 54W	Lat. of Cape St. Marys 13 20 N. Long <sup>de</sup> . W <sup>t</sup> . from London 15 36.
26					4 54		10 18	15 20	Bound for Siera Leon.
29	4 18	1	9 52	14 54	3 50		9 28	14 36	
30	4 13	2	9 12	14 16					

1725 9ber	Var <sup>n</sup> . P.M.	N. S.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. S.	Lat.	Long <sup>de</sup> .	
1	3 49W	2	9 16N	14° 10W					
8 9	5 12	3							In Siera Leon River. I judge there is something draws the comps.
14	4 47	2	7 56	12 42					Lat. of Bonas Islands 8 6 N. Long <sup>de</sup> . Wt. from London 12 10.
15	4 52	1	7 59	12 48					Bound for Cape Mount.
19	5 49	2	7 6	11 50					
20	6 20	2	6 56	11 9					
21					5 48W	1	6 42N	10 49W	
22	5 24	2.	6 42	10 49					By equal altitudes evening and morning.
24	7 0	2			7 5	1			Cape Mount E.S.E. 5 or 6 lgs. By equal altitudes evening and morning.
25	6 58	2							Cape Mount E.N.E. 2 mile.
27	7 15	2							Near the River St. John, and about 3 or 4 mile from the fhoar.
28					7 30	1			Near Great Baffa, and a little to the Wtd. of the River St. John.
29	7 28	2							Great Baffa N°. 3 lgs. 2 miles from the fhoar.
30	7 46	1							About 4 lgs. to the W <sup>ard</sup> of Sestor or Sestos Road.

1725 8ber	Var. <sup>n.</sup> P.M.	N. of O.P.	Lat.	Long <sup>de.</sup>	Var. <sup>n.</sup> A.M.	N. of O.P.	Lat.	Long <sup>de.</sup>	
4	7 30W	2							In Sestor Road.
5	7 15	2							The mouth of Sestor River N.E. by N. 4 lgs.
7	9 8	1							Setra Crue N. by W. 3 lgs.
11	9 38	2							About 5 lgs. to the W <sup>ard</sup> of the river St. Andrews.
13	9 54	1							About 3 lgs. to the W <sup>ard</sup> of Cape de la Hou.
15	10 58	1							River Casto N.W. by N. 3 mile.
18	11 0	1							The Village Tabo N.N.E. $\frac{1}{2}$ E. 3 or 4 mile.
20									
22	11 37	5							At Axim.
24									
Jan.	11 55	3			12 10W	1			At Cape Coast. At equal altitudes.
1									
5	11 25	3							The English fort at Accra N.W. 2 mile.
7	12 0	1							A little to the W <sup>ard</sup> of the River Volta.
8	12 17	2							The flag at Little Papa N. by E. $\frac{1}{2}$ E. 2 mile.
11	12 45	2							In Widah Road.
20	13 28	1	4 50	2 23E from London.					Lat. of Widah 6 40N. Long <sup>de.</sup> E <sup>t.</sup> from London 20 10'.

172 <sup>5</sup> <sub>6</sub> Jan.	Var. P.M.	N 39° 50'	Lat.	Long <sup>dc.</sup>	Var. A.M.	N 39° 50'	Lat.	Long <sup>dc.</sup>	
21	13 14W	1	3 42N	2 35E	13 30W	1	3 25N	2 32E <sup>t</sup> from London.	Bound for the Isl <sup>d</sup> St. Thomas.
23	13 54	3	2 16	3 30	13 50	1	2 2	3 40	
24	14 7	3	1 48	3 58					
25	14 19	1	1 31	4 53	14 40	2	1 32	5 15	
26	14 36	1	1 27	4 56					
31	14 48	1							At the Island St. Thomas. I make the Isl <sup>d</sup> Anna de Chary by St. Thomas to ly in 00 16 N. per obs <sup>n</sup> , and E <sup>t</sup> long <sup>dc.</sup> from London 6 16.
eb. 8	14 44	1							The Island Anna de Chary near the Island St. Thomas S.E. by E. about 7 lgs.
10					14 56	1	1 16S	1 16E from the Island Anna-bona.	Bound for Cape Lopo.
11	14 35	1	1 10S	1 44E from Anna-bona.					
15					14 50	1	0 56	0 56W from Cape Lopo.	
16	14 30	1	1 4	1 17W from Cape Lopo.	15 1	2	1 9	1 43	1
20	14 21	1	1 30	1 4W from An- nabona.					Lat. of the Island Anna-bona 1 48 S <sup>o</sup> . obs <sup>n</sup> .

1728 Feb.	Var <sup>n</sup> . P.M.	N S E W	Lat.	Long <sup>o</sup> .	A.M. Var <sup>n</sup> .	N S E W	Lat.	Long <sup>de</sup> .	
22	13 10W	2	1 46E	2 11W from D <sup>o</sup> .	13 48W	1	1 38S	2 15W from An- na-bona.	Bound for the Coast of Guinea again.
23	13 28	2	1 35	2 19	13 37	2	1 36	2 41	
24	13 46	1	1 39	3 10	13 50	1	1 25	3 35	
27	12 20	2	0 50	7 24	12 6	2	0 40	8 4	
28	12 21	2	0 20	8 18	12 25	1	0	8 35	
Mar.									
1	12 6	1	0 24N	8 55	12 20	1	1 10N	9 23	
2	12 6	1	1 34	9 42	11 44	2	1 50	9 57	
3	11 47	2	2 4	10 3					
5	11 30	3	4 16	11 21					
6	11 50	2							At Axim.
7	11 40	1							By equal Altitudes.
11	11 40	1							At Dicky's Cove.
14	11 27	2							Little Commando N. by E. $\frac{1}{2}$ E. 4 lgs.
15	11 46	2							At Cape Coast.
21	11 34	1							At Annamaboe.
23	11 53	1							At Accra. Mean between the 3 last and this one.
24									
28	12 32	2							At an anchor about 5 lgs. to the W <sup>ard</sup> of Little Papa.
29	12 43	2							At Little Papa.

1726 Apr.	Var. P.M.	N or S	Lat.	Long <sup>de.</sup>	Var. A.M.	N or S	Lat.	Long <sup>de.</sup>	
13 14 17	13 10W	4							In Widah Road.
22	13 0	1	5 18N	2 46E from London.					Lat. of Widah 6 48 N. obs <sup>n</sup> . Long <sup>de.</sup> E <sup>r</sup> . from London 2 10.
24	13 11	1	4 21	2 50					
30	14 35 14 29*	2							At the Island St. Thomas.* By equal altitudes evening and morning. Note, by the of long <sup>de.</sup> made from Wjdah this and the last time, I dif- fered but 4 minutes; so that I judge the Island St. Thom- as is laid down almost 2 de- grees too far E <sup>r</sup> terly, and our passage from St. Thomas to Barbadoes confirms me in this oppinion, having gained that passage in 33 days, and had a fair wind all the way.
May 19	13 44	1	0 4	3 48E from London.	13 44W	1	0 10S	2 48E from London.	Lat. of the Island Anna de Chares by St. Thom. o 16N. Long <sup>de.</sup> E <sup>r</sup> . from London 6 16.
20	13 10	2	0 28S	1 51	12 42	1	0 46	0 39	Bound for Barbadoes.
21	12 34	1	1 2	0 13W from London.	11 38	1	1 18	1 33W from London.	
22	11 12	1	1 33'	2 41					
23	10 4	1	1 45	5 15					
24	8 35	1	2 9	7 46	8 34	1	2 22	9 32	

1726 May	Var <sup>n</sup> . P.M.	N <sup>o</sup>	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>o</sup>	Lat.	Long <sup>de</sup> .	
	Var <sup>n</sup> . P.M.	N <sup>o</sup>	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>o</sup>	Lat.	Long <sup>de</sup> .	
25	6 54W	1	2 31S	10 44W	6 52W	1	2 36S	11 51W	
26	6 23	2	2 40	12 40					
27	4 53	2	2 38	14 30	4 24	2	2 29	15 34	
28	3 31	2	2 30	16 24	2 21	2	2 50	17 36	
29	2 25	1	2 52	18 39					
30					0 41	2	2 53	22 33	
31	0 5E	1	2 46	23 44	0 4E	2	2 27	25 1	
June									
	0 17W	2	2 12	26 6	0 16W	3	1 33	27 2	
	0 16E	2	1 0	28 4	0 18E	3	0 19	29 7	
	0 22	1	0 25N	29 40	0 19	1	1 7N	30 39	
	0 36	2	1 38	31 18	0 26	1	2 20	31 55	
					0 26	1	4 20	34 6	
	0 34	1	4 42	34 13	0 37	2	5 0	34 16	
	0 30	2	5 20	34 22W					Bound for Barbadoes.
	0 14	1	6 47	35 33	0 10	1	7 4	37 0W <sup>E</sup> from London.	
					0 36	1	8 42	41 10	
13	0 50	1	10 4	44 52	1 32	1	10 48	46 25	
14	1 36	1	11 18	47 43	1 26	1	11 48	49 2	
15					2 22	1	12 26	51 6	

	Var <sup>n</sup> . P.M.	N <sup>o</sup> of Obs.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N <sup>o</sup> of Obs.	Lat.	Long <sup>de</sup> .	
1726 June									
16	2 16E	1	12 44N	52 22W	2 37E	2	12 56N	54 6W	
17	3 0	1	13 5	55 28	3 36	1	13 12	57 3	Note, I make the center of Barbadoes to ly in 13 27 N. by obs <sup>n</sup> . and Wt. long <sup>de</sup> . from London 58 1'. Having a fair wind all the way, this makes me believe that the Island Anna de Chares; viz. 16 16 E. is near the truth.
26									
27	4 24	3							In Carlisle Bay at Barbadoes.
28									
29	3 26	1							Lambert's Point on the N.W <sup>t</sup> part of Barbadoes E.S.E. 5 lgs.
July									
1	3 22	1							The W <sup>t</sup> ermost part of Guardalupa N.E. $\frac{1}{2}$ N. 4 or 5 lgs.
2	4 10	1							At Backstar on the Island St. Christophers.
6	5 22	1	17 58	9 2W from Palmetta Point on the Island St. Christophers.					Within 4 or 5 lgs. of Hispaniola, and a little to the W <sup>t</sup> ward of Cape Zapazen on Hispaniola.
7	5 12	1	17 40	o 46W from the Island Alonvala near Cape Alongia on Hispaniola.					

1726 July	Var <sup>n</sup> . P. M.	N S. O. S.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N S. O. S.	Lat.	Long <sup>de</sup> .	
9	5 3E	I	18 0N	0 46W from D°.	5 12E	I			Saw the E <sup>t</sup> . end of Jamaica.
12	6 2	I	17 6	0 12E from Port- land Point on Jamaica					Bound for Porto Bell.
13					6 30	I	14 28N	0 38W from Port- land Point on Jamaica	
14	7 0	I	13 32	0 58W from D°.	7 8	I	12 27	1 25W from D°.	
15	7 16	I	11 32	1 52W from D°.	7 30	I	10 46	2 18W from D°.	
16					7 22	I	9 51	2 39W from D°.	
22					7 48	I			At an anchor without the Island called the <b>Great Baf-</b> <b>timentos.</b>
Aug. 7	7 24	I							Cape Cathivas near the <b>Gulph</b> of Darien S.E. by S. 7 lgs.
9	7 30	I	9 40	1 27E from Cape Cathivas.					
11	6 50	I							The land called Mother la Pope near Cartagena S. by E. 1/2 E. 5 lgs.

Var <sup>n.</sup> P.M.	Var <sup>n.</sup> A.M.	Lat.	Long <sup>de.</sup>	Var <sup>n.</sup> P.M.	Var <sup>n.</sup> A.M.	Lat.	Long <sup>de.</sup>
1726 Aug.							
12 6 20E	1						
13 6 14	1 12 52N	o 42W from Point Jamba.					
14 6 4	1 14 0	o 50W from D°.					
15 5 42	1 15 18	1 3W from D°.					
16			5 28E	2 17 6N	1 30W from D°.		
7ber 12 4 31	3						
8ber 12				4 49	1 18 40	1 53W from Point Negril on Jamaica.	
13				4 41	1 19 54	o 57W from the N.W. end of the Grand Commandis	
14				4 4	1 20 44	2 7W from D°.	Bound through the Gulph of Florida.
17 4 7	2 22 53	o 16W from Cape St. Antonio on the W <sup>t</sup> . end of the Island Cuba.					

1726 8ber	Var <sup>n</sup> . P. M.	N. of O.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A. M.	N. of O.	Lat.	Long <sup>de</sup> .	
18	4 25E	2 22	31N	0 55E from Cape Antonio.					
19					4 0E	1			The middle of the Table Land S. by E. $\frac{1}{2}$ E. 4 lgs. This Table Land is about 5 lgs. to the W <sup>ard</sup> of the Ha- vanna.
23					4 24	1			The high round hill, called Pan de Mathaneas, a little to the E <sup>ard</sup> of the bay of the same name on Cuba, bore S. W. by S. 10 or 12 lgs.
24	4 23	2 23	30	0 38E from Pan de Matha- neas.					
25	3 26	1							The land about Cape Florida N. by W. 6 lgs. A great swell.
26	3 5	1 25	12	81 20W from London.					In the Gulph. Lat. of Cape Florida 24 48 N. Long <sup>de</sup> . Wt. from London 21 55.
28					2 11	1 27 50N	81 30W from London.		A great swell.
30					0 56	1 29 35	80 40		D <sup>o</sup> . swell.
9ber 3					2 14W	1 33 25	71 52		A very great sea.
6					5 12	1 35 4	64 6		A great sea.
8	5 8W	1 35 15	61 56						

1726 9ber	Var. P.M.	$\frac{z}{\text{Var.}}$	Lat.	Long. <sup>w.</sup>	Var. A.M.	$\frac{z}{\text{Var.}}$	Lat.	Long. <sup>w.</sup>	
	1790	1790	1790	1790	1790	1790	1790	1790	
9	4 55W	1	35 0N	61 55W from London.					Going back to the Wt. Indies. Swell much abated.
10	5 6	1	33 14	61 14					
14	0 41	2	26 14	58 9	0 36W	1	25 48N	58 6W from London.	
15	1 3	1	25 41	58 0	0 54	1	25 20	37 14	
16	4	1	24 48	56 38					
17	0 20	1	23 0	56 35					
18	0 32E	1	21 7	56 32	1 46E	1	19 54	56 21	
19					1 46	1	18 56	56 21	
20	1 43	1	18 32	56 22	2 25	1	17 34	56 17	
21	2 15	1	16 52	56 22	3 11	1	16 12	56 50	
22					3 26	1	15 58	58 6	
23	3 27	1			3 40	1			Island Descado S.W. $\frac{1}{2}$ W. 5 lgs. I make Descado to to ly in 16 10 N. obs <sup>n</sup> , and W. long <sup>de</sup> . from London 59 5.
29	4 4	1							In sight of Antego.
1727 Apr. 14	4 28	1							The high land of the Island Nevis W. $\frac{1}{2}$ S <sup>o</sup> . 7 lgs. The Island Rodunda S. by W. $\frac{1}{2}$ W. 7 lgs. The center of the Island Antego E. by S. $\frac{1}{2}$ S. 7 lgs.

1727 Apr.	Var <sup>n</sup> . P.M.	N <sup>r</sup> of Jdg <sup>r</sup>	Lat.	Long <sup>de</sup> .	A.M. Var <sup>n</sup> .	N <sup>r</sup> of Jdg <sup>r</sup>	Lat.	Long <sup>de</sup> .	
15	3 30E	2	18 36N	61 18W from London.	2 56E	1	19 20N	61 20W from London.	Lat. of the Island Nevis 17 15 N. Long <sup>de</sup> . W. from Lon- don 61 10.
17	3 2	4	19 50	61 14					Bound for England.
19	2 22	3	20 56	61 28					
22	0 51	3	25 20	61 24	1 7	3			
23	0 43	1	25 54	61 23	0 16	2	26 6	61 21	
24					0 15W	2	26 16	61 30	
25					0 41E	1	26 24	61 47	
26					0 18	3	26 34	61 48	Mean of the evening and morning.
27	0 35	1	27 44	61 44					
28					0 38W	4	28 36	60 52	
29	0 42W	2	28 46	60 54	0 48	2	29 6	60 50	
30	1 18	2	30 9	60 45	1 56	1	31 26	60 4	
May									
1	2 32	1	32 28	59 33	3 16	1	32 54	59 16	
2	4 5	2	33 54	58 43					
6	9 5	2	40 28	55 42					
7	10 12	1	41 56	52 54					

1727 May	Var <sup>n</sup> . P. M.	N. S. O. S.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	N. S. O. S.	Lat.	Long <sup>re</sup> .	
	9 11 54 W	2	43 56 N	48 41 W					This day founded having 35 fathom fine brown sand; by this we judge we are on the great bank.
10	12 37	3	44 30	46 0					
12	14 20	1	46 12	39 18					A great sea.
13	14 0	1	46 51	35 15					Do. sea.
15	12 54	1	46 16	28 25					Do. sea.
17	11 39	2	46 10	23 53					Smooth water.
21	11 46	2	48 45	15 12					
26	13 24	2							In sight of Portland, dist. about 5 legs.

Note, By my reckoning I made the Lizard to ly in 50 6 by judgement, and W<sup>t</sup>. longitude from London 5 27; and as I have set down the lat. and long<sup>de</sup>. at the time of obs<sup>n</sup>. by this it may appear how far these observations may be relied on.

VARIATION of the COMPASS from Madera to the Wt. Indies,  
Lark, Captain GRAY.

1727 xber	Var <sup>n</sup> . P.M.	$\frac{Z}{N}$ or Q.P.	Lat.	Long <sup>de</sup> .	Var <sup>n</sup> . A.M.	$\frac{N}{Z}$ or Q.O.	Lat.	Long <sup>de</sup> .	
30	6 58W	3							In Madera Road.
Jan. 6	6 18	1	28 52N	19 46W from London.					Lat. Wt. end of Madera 32 25 N. Long <sup>de</sup> . Wt. from London 17 42.
1727 18					2 16E	1	16 19N	51 5W from London.	
19	2. 14E	1	16 29	52 8					
20	2 48	2	16 18	54 53	3 58	1	16 16	56 47	
21	3 58	1	16 24	53 20					
22	3 40	2							Island Defcado S.E. $\frac{1}{2}$ E. 8 lgs. N.W. part of Guardalupa S.W. $\frac{1}{2}$ S. 6 lgs. N.E. part of Antego N.W. by W. 8 lgs.
23	4 49	2							At the Island St. Christopher.
27	6 2	2							Island Altovalla near Hispaniola N.E. by N. $\frac{1}{4}$ E. 5 lgs.
Feb. 19	7 37	3							The land called Mother La Pope, near Cartegena, S. by E. 10 or 12 lgs.

VARIATION of the COMPASS in going towards Lisbon from England, and in the Mediterranean, Dreadnought, Capt. GEDDES.

1730 May	Var. P.M.	N 190 <sup>30</sup>	Lat.	Long <sup>de.</sup>	Var. A.M.	N 190 <sup>30</sup>	Lat.	Long <sup>de.</sup>	
	5 13 26W	2 45 22N		9 39W from London.					
	7 12 3	2 41 32		10 39					
1731 July 27	12 48	1							Island Sizarga S.E. 2 lgs. This island is about 5 lgs. to the W <sup>ard</sup> of the Groin.
	28 12 12	1 41 56		9 26					
	29 12 26	1 40 0		10 3					
8ber 8	11 10	1							The land about Cape Dragon in the Mediterranean N. by E. 12 or 14 lgs.
	11 10 52	1							Cape Toulon N.W. $\frac{1}{2}$ W. 6 lgs.
	20 9 42	2							In Leghorn Road.
xber 6	10 48	1 41 34		18 54W from London.					In our passage to England.

VARIATION of the COMPASS in the Mediterranean,  
Hector, Sir ROGER BULTER.

1733 Apr.	Var. P.M.	N S O E	Lat.	Long <sup>de</sup> .	Var. A.M.	N S O E	Lat.	Long <sup>de</sup> .	
21	14 2W	1	34 2N	12 30E from London.					Between the Island Pantalan and Tripoly in Barbary.
22	13 22	1							The obser <sup>n</sup> . not very good. In sight of the land to the E <sup>ard</sup> of Tripoly.
26	14 20	2	34 16	12 22					Between Tripoly and the Island Lampodoria.
7ber									
17	13 38	3							In Gibralter Bay.
27	13 49	3							Cape St. Vincent N. by E. $\frac{1}{2}$ E. 4 lgs.
9ber									
9	13 56	2							Bound for Gibralter towards Cape de Gatt.
11	14 12	2							Island of Alborne W. by S. 3 leagues.
18	14 34	1							Cape Mola on the Island Mi- norca N.N.E. 4 or 5 lgs.
Mar.									
10	14 20	1							Cape St. Marys on the Coast of Portugal N.E. by E. 6 or 7 lgs.
1734 Apr.									
6	13 56	3							On the Coast of Barbary near Larac.

1735 Aug.	Var. P.M.	N J <sup>o</sup> O <sup>o</sup> S <sup>o</sup>	Lat.	Long <sup>de</sup> .	Var. A.M.	N J <sup>o</sup> O <sup>o</sup> S <sup>o</sup>	Lat.	Long <sup>de</sup> .	
9 11	33W	2	38 8N	14 2W from London.					Going from the Coast of Barbary to Lisbon.
10 11	44	1	38 8	12 55					
1735 Aug.	12 19	3							In Sal'ee Road on the Coast of Barbary.

In Scanderoon Bay, 1711, I found 16° W. variation.

At Elsinore and Carlescroon in the Baltic, 1716, I found a point W<sup>t</sup>. variation.